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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,207	09/18/2003	Gregory C. Burnett	ALPH.P010X	7159

7590 02/09/2007

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EXAMINER	
LAO, LUN S	
ART UNIT	**PAPER NUMBER**
2615	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/667,207	BURNETT ET AL.	
	Examiner	Art Unit	
	Lun-See Lao	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-44* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Introduction

1. This communication is responsive to the applicant filed on 09-18-2003. Claims 1-44 are pending.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-44 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-39 and US Patent application

publication (US 2003/0228023). Although the conflicting claims are not identical, they are not patentably distinct from each other.

Consider claims 1-44, substantially all the claimed steps in these claims were recited in claims 1-39 of the patent identified above, such as the steps of:" a method for removing noise from acoustic signals, comprising: receiving a plurality of acoustic signals; 3 receiving information on the vibration of human tissue associated with human voicing activity; generating at least one first transfer function representative of the plurality of 6 acoustic signals upon determining that voicing information is absent from the plurality of 7 acoustic signals for at least one specified period of time; and 8 removing noise from the plurality of acoustic signals Using the first transfer 9 function to produce at least one denoised acoustic data stream" (see US 2003/0228023, claims 1-39, page 14 line 7-page16 line 9).

Because claims 1-44 of US patent application 10/667,207 are similar in scope to claims 1-39 of the US Patent application publication (US 2003/0228023) with obvious wording variation, they are both describing "the voice activity detector and denoice acoustic data stream ". Claims 1-44 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-39 of US Patent application publication (US 2003/0228023).

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim1-3, 5-18, 20-30 and 33-44 are rejected under 35 U.S.C. 102(b) as being anticipated by Holzrichter (US PAT. 5,729,694).

Consider claim 1 Holzrihter teaches a method for removing noise from acoustic signals, comprising:

receiving (see fig.43, 52) a plurality of acoustic signals;

receiving (43) information on the vibration of human tissue associated with human voicing activity;

generating at least one first transfer function (57) representative of the plurality of acoustic signals upon determining that voicing information is absent (such as, unvoice) from the plurality of acoustic signals for at least one specified period of time (such as, time frames)(see col.28 line 38-48); and

removing noise (removing noise is inherent to speech recognition algorithm to extract the best speech feature and avoid noise) from the plurality of acoustic signals using the first transfer (57) function to produce at least one denoised acoustic data stream (60, see col. 15 line 29-col. 16 line 3 and col. 60 line 19-30).

Consider claim 39 it is the computer readable medium claim corresponding to method claim 1. See previous method claim 1 rejection.

Consider claim 42 it is the electromagnetic medium claim corresponding to method claim 1. See previous method claim 1 rejection.

Consider claims 2-3 Holzrihter teaches the method of removing noise further comprises:

generating at least one second transfer function (see fig.5 (56)) representative of the plurality of acoustic signals upon determining that voicing information is present in the plurality of acoustic signals for the at least one specified period of time (such as, time frames)(see col.28 line 38-48), and removing noise (removing noise is inherent to speech recognition algorithm to extract the best speech feature and avoid noise) from the plurality of acoustic signals using at least one combination (58) of the at least one first transfer function (57) and the at least one second transfer function (56) to produce at least one denoised acoustic data stream(see col. 15 line 29-col. 16 line 3 and col. 60 line 19-30); and the plurality of acoustic signals include inherently (because the EM sensor 43 and microphone 52 picks up the noise source signal and the acoustic signal) at least one reflection of at least one associated noise source signal and at least one reflection of at least one acoustic source signal (see col. 14 line 46-67 and col.24 line 29-61).

Consider claims 27 and 36, 40, 43, they are essentially similar to claim 2 and are rejected for the reason stated above apropos to claim 2.

Consider claims 13-14, they are essentially similar to claim 3 and are rejected for the reason stated above apropos to claim 3.

Consider claims 5-8 Holzrichter teaches that the method of removing noise further includes generating at least one third transfer function (see fig.5 (59)) using the at least one first transfer function (57) and the at least one second transfer function (56); the method of generating the at least one first transfer function (see fig.5 (57)) comprises recalculating the at least one first transfer function during at least one prespecified interval (see col. 19 line 26-col. 20 line 15); and the method of generating the at least one second transfer function (see fig.5 (56)) comprises recalculating the at least one second transfer function during at least one prespecified interval (see col. 19 line 26-col. 20 line 15); and the method of generating the at least one first transfer function (see fig.5 (57) comprises use of at least one technique selected from a group consisting of adaptive techniques and recursive techniques (see col. 19 line 26-col. 20 line 15).

Consider claims 21-22, they are essentially similar to claims 7-8 and are rejected for the reason stated above apropos to claims 7-8.

Consider claims 9-11 Holzrichter teaches that the method of information on the vibration of human tissue is provided by a mechanical sensor (such as, motion sensor) in contact with the skin (see figs 3a-3b(29,30,33)) and see col. 14 line 46-col. 15 line 18); and the method of information on the vibration of human tissue is provided via at least one sensor selected from among at least one of an accelerometer, a skin surface microphone in physical contact with skin of a user, a human tissue vibration detector, a radio frequency (R.F) vibration detector, and a laser vibration detector(see figs 3a-

3b(29,30,33) and see col. 14 line 46-col. 15 line 18); and the human tissue is at least one of on a surface of a head, near the surface of the head, on a surface of a neck, near the surface of the neck, on a surface of a chest, and near the surface of the chest(see figs 3a-3b(29,30,33)) and see col. 14 line 46-col. 15 line 18).

Consider claims 16 and 28, they are essentially similar to claim 9 and are rejected for the reason stated above apropos to claim 9.

Consider claims 17 and 29, they are essentially similar to claim 10 and are rejected for the reason stated above apropos to claim 10.

Consider claims 15, 25, 30, 34, 38 and 41, 44, they are essentially similar to claim 11 and are rejected for the reason stated above apropos to claim 11.

Consider claim 12 Holzrichter teaches that a method for removing noise from electronic signals, comprising:

detecting (see fig.5, (43, EM sensor)) an absence (unvoice) of voiced information during at least one period (see col. 28 line 38-48), wherein detecting includes measuring the vibration of human tissue (see col. 5 line 66-col. 6 line 55); receiving at least one noise source signal during the at least one period (see col. 24 line 29-61); generating at least one transfer function (57) representative of the at least one noise source signal; receiving at least one composite signal comprising acoustic and noise signals; and removing the noise (removing noise is inherent to speech recognition algorithm to extract the best speech feature and avoid noise) signal from the at least one composite signal using the at least one transfer function to produce at least one

denoised acoustic data stream(60, see col. 15 line 29-col. 16 line 3 and col. 60 line 19-30).

Consider claims 18 and 20 Holzrichter teaches that the method of receiving includes receiving the at least one noise source signal using at least one microphone (see fig.5 (52)); and the method of removing the noise signal from the at least one composite signal using the at least one transfer function (see fig.5 (59)) includes generating at least one other transfer function (57) using the at least one transfer function (see col. 15 line 29-col. 16 line 3).

Consider claim 23 Holzrichter teaches a method for removing noise from electronic signals, comprising:

determining (see fig.5 (40)) at least one unvoicing period during which voiced information is absent (such as, unvoice) based on vibration of human tissue;

receiving (43, 52) at least one noise signal input during the at least one unvoicing period (see col.28 line 38-48) and generating at least one unvoicing transfer function(56) representative of the at least one noise signal (see col. 24 line 29-61);

receiving (43,52) at least one composite signal comprising acoustic and noise signals; and removing the noise signal (removing noise is inherent to speech recognition algorithm to extract the best speech feature and avoid noise) from the at least one composite signal using the at least unvoicing transfer function to produce at least one denoised acoustic data stream (60, see col. 15 line 29-col. 16 line 3 and col. 60 line 19-30).

Consider claim 24 Holzrichter teaches that the method of producing at least one denoised acoustic data stream further includes:

determining (see fig.5 (40)) at least one voicing period during which voiced information is present; receiving (52) at least one acoustic signal input from at least one signal sensing device during the at least one voicing period (see col.28 line 38-48) and generating at least one voicing transfer function (57) representative of the at least one acoustic signal; and removing the noise signal from the at least one composite signal using at least one combination of the at least one unvoicing transfer function (56) and the at least one voicing transfer function (57) to produce the denoised acoustic data stream (60, see col. 15 line 29-col. 16 line 3 and col. 60 line 19-30).

Consider claim 26 Holzrichter teaches a system for removing noise from the acoustic signals, comprising:

at least one receiver (see fig.5 (52)) that receives at least one acoustic signal;

at least one sensor (43) that receives human tissue vibration information associated with human voicing activity;

at least one processor (see fig.3b (proceeding electronics)) coupled among the at least one receiver and the at least one sensor (52,43) that generates a plurality of transfer functions (56, 57,59), wherein at least one first transfer function (57) representative of the at least one acoustic signal is generated in response to a determination that voicing information is absent (unvoice) from the at least one acoustic signal for at least one specified period of time (such as, time frames)(see col.28 line 38-48), wherein noise is removed (removing noise is inherent to speech recognition

algorithm to extract the best speech feature and avoid noise) from the at least one acoustic signal using the first transfer function to produce at least one denoised acoustic data stream (60, see col. 15 line 29-col.16 line 3 and col. 60 line 19-30).

Consider claim 33 Holzrichter teaches a system for removing noise from acoustic signals, comprising at least one processor (see fig.3b (processing electronics)) coupled among at least one microphone (see fig.5 (52)) and at least one voicing sensor (43), wherein the at least one voicing sensor (43) detects human tissue vibration associated with voicing, wherein an absence of voiced information (unvoice) is detected during at least one period (such as, time frames)(see col.28 line 38-48) using the at least one voicing sensor, wherein at least one noise source signal is received during the at least one period using the at least one microphone (52), wherein the at least one processor generates at least one transfer function (57) representative of the at least one noise source signal, wherein the at least one microphone(52) receives at least one composite signal comprising acoustic and noise signals, and the at least one processor removes the noise signal(removing noise is inherent to speech recognition algorithm to extract the best speech feature and avoid noise) from the at least one composite signal using the at least one transfer function (57) to produce at least one denoised acoustic data stream(60, see col. 15 line 4-col.16 line 3 and col. 60 line 19-30).

Consider claim 35 Holzrichter teaches a signal processing system (see fig.3b, (processing electronic)) coupled among at least one user and at least one electronic device (see fig.3b, (processing electronic)), wherein the signal processing system (processing electronic) includes at least one denoising subsystem (see fig. 5) for

removing noise from acoustic signals, the denoising subsystem (fig.5) comprising at least one processor coupled among at least one receiver and at least one sensor (43, EM sensor), wherein the at least one receiver is coupled to receive at least one acoustic signal, wherein least one sensor (43) detects human tissue vibration associated with human voicing activity (see col. 15 line 4-18), wherein the at least one processor generates a plurality of transfer functions (56, 57,59), wherein at least one first transfer function (56) representative of the at least one acoustic signal is generated in response to a determination that voicing information is absent (such as, unvoice) from the at least one acoustic signal for at least one specified period of time(such as, time frames)(see col.28 line 38-48), wherein noise is removed (removing noise is inherent to speech recognition algorithm to extract the best speech feature and avoid noise) from the at least one acoustic signal using the first transfer function to produce at least one denoised acoustic data stream (60, see col. 15 line 4-col.16 line 3 and col. 60 line 19-30).

Consider claim 37Holzrichter teaches that the system of the at least one electronic device includes at least one of cellular telephones, personal digital assistants, portable communication devices, computers, video cameras, digital cameras, and telematics systems(see col. 16 line 51-67).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 4, 19 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Holzrichter (US PAT. 5,729,694).

Consider claim 4 Holzrichter teaches implementing a microphone (acoustic sensor, e.g. microphone, col. 16 lines 14-15; col. 11 lines 29-30) coupled to a processor but does not teach implementing a plurality of microphones. At the time of the invention, it would have been obvious to one of ordinary skill in the art to implement a plurality of microphones for flexibility, thus gathering acoustic information in various areas instead of implementing one microphone in that is restricted to a certain area.

Consider claims 19 and 32, they are essentially similar to claim 4 and are rejected for the reason stated above apropos to claim 4.

8. Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Holzrichter (US PAT. 5,729,694) in view of Sugiyama(US PAT 5,517,435).

Consider claim 31 Holzrichter does not clearly teach the system of further comprising: dividing acoustic data of the at least one acoustic signal into a plurality of subbands; removing noise from each of the plurality of subbands using the at least one first transfer function, wherein a plurality of denoised acoustic data streams are generated; and 6 combining the plurality of denoised acoustic data streams to generate the at least one denoised acoustic data stream.

However, Sugiyama teaches the system of further comprising:

dividing (see fig.1, (50)) acoustic data of the at least one acoustic signal into a plurality of subbands;

removing (60) noise from each of the plurality of subbands using the at least one first transfer function, wherein a plurality of denoised acoustic data streams are generated; and

combining (8) the plurality of denoised acoustic data streams to generate the at least one denoised acoustic data stream (see col. 1 lines 12-35).

Therefore, it would have obvious to one of ordinary skill in the art the time the invention was made to combine the teaching of Sugiyama and Holizrichter to provide faster convergence of filter coefficients and more efficient computation.

Conclusion

9. The prior art made of record and not relied upon is considered to applicant's disclosure. Holzrichter (US PAT. 6,006,175) is recited to show other related the voice activity detector (VAD)- based multiple-microphone acoustic noise suppression.

10. Any response to this action should be mailed to:

Mail Stop ____(explanation, e.g., Amendment or After-final, etc.)

Commissioner for Patents
P.O. Box 1450
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Facsimile responses should be faxed to:
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11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lao,Lun-See whose telephone number is (571) 272-7501 The examiner can normally be reached on Monday-Friday from 8:00 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian, can be reached on (571) 272-7848.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 whose telephone number is (571) 272-2600.

Lao,Lun-See L.S.
Patent Examiner
US Patent and Trademark Office
Knox
571-272-7501
Date 02-01-2007

VIVIAN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600